WHAT IS CLAIMED IS:

1. A method of forming an isolation trench including a nitride liner in a semiconductor substrate, comprising:

a first step of etching the substrate to form a trench;

a second step of forming a conformal material layer on both sidewall and bottom of the trench;

a third step of growing a thin thermal oxide layer between the conformal material layer and the substrate defining the trench through a thermal oxide process for preventing etch damage while etching the substrate;

a fourth step of forming the nitride liner on the material layer; and

a fifth step of using trench isolation material to fill the trench.

2. The method as claimed in claim 1, wherein the conformal material is selected from a group consisting of high temperature oxide (HTO), middle temperature oxide (MTO), aluminum trioxide (Al_2O_3), and tantalum pentaoxide (Ta_2O_5).

3. The method as claimed in claim 1 or 2, wherein the conformal material layer is formed to a thickness of 50Å-400Å, and the thermal oxide layer is formed to a thickness of 20Å-150Å.

4. The method as claimed in claim 1, wherein the trench isolation material is made of high-density plasma (HDP) oxide or borophosphosilicate glass (BPSG) to a thickness of 3000Å-10000Å.

5. A method of forming an isolation trench including a nitride liner in a semiconductor substrate, comprising:

etching the substrate to form a trench;

forming an impurity material diffusion barrier layer on both sidewalls and a bottom of the trench, the barrier layer preventing impurity material penetration caused by formation of the nitride liner;

forming the nitride liner on the barrier layer; and

using trench isolation material on the nitride liner to fill the trench.

6. The method as claimed in claim 5, wherein the step of forming the barrier layer comprises the step of:

forming a conformal material layer on the sidewall and bottom of the trench after forming the trench; and

growing a thin thermal oxide layer between the conformal material layer and the substrate defining the trench through a thermal oxide process for preventing etch damage while etching the substrate.

7. The method as claimed in claim 6, wherein the conformal material layer is formed to a thickness of 50Å-400Å, and the thermal oxide layer is formed to a thickness of 20Å-150Å.

8. The method as claimed in claim 6 or 7, wherein the conformal material is selected from a group consisting of high temperature oxide (HTO), middle temperature oxide (MTO), aluminum trioxide (Al_2O_3), and tantalum pentaoxide (Ta_2O_5).

9. The method as claimed in claim 5, wherein the step of forming the barrier layer comprises the steps of:

forming both the sidewalls and the bottom of the trench through the thermal oxidation process for preventing etch damage while etching the substrate, after forming the trench; and

forming a conformal material layer on the thermal oxide layer.